

AMENDMENTS TO THE CLAIMS

Claim 1 (Previously Presented): A method of lubricating a steel sheet, the method comprising

providing a steel sheet coated with a layer consisting of a metal coating based on zinc or a zinc alloy;

treating the coated steel sheet with an aqueous treatment solution containing sulfate ions SO_4^{2-} in a concentration of not less than 0.01 mol/l to obtain on the metal coating an upper layer based on zinc hydroxysulfate and zinc sulfate; and

applying on the upper layer based on zinc hydroxysulfate and zinc sulfate a lubricating oil film with a weight of between 0.2 and 0.5 g/m².

Claim 2 (Previously Presented): The method as claimed in claim 1, wherein the aqueous treatment solution further contains Zn^{2+} ions in a concentration of not less than 0.01 mol/l.

Claim 3 (Previously Presented): The method as claimed in any one of claims 1 and 2, wherein a sulfur content of the upper layer is not less than 0.5 mg/m².

Claim 4 (Previously Presented): The method as claimed in claim 2, wherein the Zn^{2+} ion concentration and the SO_4^{2-} ion concentration in the aqueous treatment solution are between 0.07 and 0.55 mol/l.

Claim 5 (Previously Presented): The method as claimed in any one of claims 1 and 2, wherein the pH of the aqueous treatment solution is between 5 and 7.

Claim 6 (Previously Presented): The method as claimed in any one of claims 1 and 2, wherein a sulfur content of the upper layer is between 3.7 and 27 mg/m².

Claim 7 (Previously Presented): The method as claimed in any one of claims 1 and 2, further comprising, after the coated steel sheet has been treated with the aqueous treatment solution, drying the sheet, after optionally rinsing the sheet in order to remove a soluble portion of the upper layer.

Claim 8 (Previously Presented): The method as claimed in claim 1, wherein the coated steel sheet is treated with the aqueous treatment solution under anodic polarization and the pH of the aqueous treatment solution is equal to 12 or higher, but less than 13.

Claim 9 (Previously Presented): The method as claimed in claim 8, further comprising, during the treating, adjusting a density of electrical charges flowing through a surface of the sheet in order to form the upper layer, the sulfur content of which is 0.5 mg/m² or higher.

Claim 10 (Previously Presented): The method as claimed in any one of claims 8 and 9, wherein the SO₄²⁻ ion concentration in the aqueous treatment solution is greater than 0.07 mol/l.

Claim 11 (Previously Presented): The method as claimed in claim 9, wherein the amount of sulfur in the upper layer is between 3.7 and 27 mg/m².

Claim 12 (Previously Presented): The method as claimed in claim 8, wherein the polarization current density during the treating is greater than 20 A/dm².

Claim 13 (Previously Presented): The method as claimed in claim 8, wherein, after treating the coated steel sheet with the aqueous treatment solution, the sheet is rinsed.

Claims 14-17 (Canceled)